THE SECRET OF HIGH WAGES

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AND

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FOREWORD

This book treats of a very vital problem; for on the challenging issues which it raises depends the economic future of Britain. No European can visit America without realising that across the Atlantic changes are occurring which amount to an economic revolution. Tens of millions of people have attained there standards of comfort and of culture far higher than those of any other country in the world to-day, and immensely in excess of anything hitherto known in the world's history; while the rate of material advancement has accelerated to break-neck speed. With this abounding prosperity there have been developing new traditions and novel ideas in the world of affairs, in the relations between buyer and seller, between employer and employed, between those who own industry and those who manage it.

The Englishman visiting the United States inevitably asks himself where we stand in relation to these great and rapid changes. Is Great Britain destined to keep abreast of the great progress of the United States of America in the next ten or twenty years; or can we hope to do no more than maintain our present standard while the New World passes by and leaves us to sink into the respectable but unexciting status of a comparatively poor relation?

FOREWORD

Many of those who think that we cannot hope to keep pace with America base their view on the abundant resources with which nature has so richly endowed her. The evidences on this point are indeed striking. Recent figures show that whereas America contains only some 7 *per cent. of the world's population, she produces* 22 *per cent. of its wheat,* 43 *per cent. of its coal,* 53 *per cent. of its copper,* 58 *per cent. of its cotton,* 60 *per cent. of its steel, and* 72 *per cent. of its oil. Truly the Dives of the modern world!*

But Britain also has economic assets. Apart from the resources of these islands, she is a country which has great possessions and the world for her market. It is a mistake to assume that in the matter of resources America has everything her own way. The British Empire produces 60 *per cent. of the world's wool and rubber,* 70 *per cent. of its tea and gold,* 89 *per cent. of its nickel and* 99 *per cent. of its jute, to mention a few only of its products; while Great Britain alone, with but* 3 *per cent. of the world's population, owns over* 30 *per cent. of the world's ships and* 40 *per cent. of its cotton spindles. While, however, the balance sheet of natural resources is an important factor in determining the prosperity of nations, these resources are useless without the knowledge and the enterprise needed to exploit them. The implicit assumption of this book is that if we fail it will not be for lack of resources but because we are too slow in learning new ways of exploiting our inheritance.*

FOREWORD

Last autumn two highly qualified young engineers planned on their own initiative, and at their own expense, an intensive tour of some of the industrial regions of the United States, with the object of wresting from America the secret of her rapid industrial progress. The conclusions at which they arrived are contained in this book. It is a work of considerable importance—not primarily as a treatise on economics, but because it contrives to convey in an unmistakable manner something of the atmosphere of the American industrial world and the point of view of its managers.

The gospel which Mr. Austin and Mr. Lloyd have come home to preach is not a new one. Its central features are, on the one hand, the old theory of the economy of high wages, and, on the other, the business maxim, that it is generally more profitable in the long run to aim at a big output or turnover at low prices, than to aim at high prices. These doctrines are familiar in theory, but are too commonly ignored in practice. The thesis of the present report is that the hope of salvation for Great Britain lies in overcoming the deep-rooted prejudices against them.

It may be argued that America's experience is no real guide for Britain on the ground that the great growth of America's population has provided a rapidly expanding market, while the labour situation is entirely different from that in Britain. But these objections are not valid against the main contention. The manufacturer who

casts his eye over the markets of the world will at once recognise that the problem with which the salesman of British industrial products is faced is not the absence of markets, but the fact that his prices are too high; and as to labour conditions any impartial observer must admit that the traditional wage policy of employers in many British industries is largely to blame for the opposition to payment by results, and for the fact that the wage earner concentrates more attention on the standard rate of his class rather than on the prosperity of his firm, or on the hope of rising to a higher position. Our recent industrial history would have been very different if more industries had realised the economic importance of a wage system which provided big prizes for wage earners.

In the bad old days, when factory hours were long, there was in every Lancashire town an individual known as the "knocker-up." Early every morning—often hours before the dawn—the silence would be broken by his insistent tap on one window pane after another down the empty street. Within a few minutes of his passing would be heard first one step, then another, quickly swelling to a roar of clattering clogs, hurrying along the cobbled road to the neighbouring mill. Mr. Austin and Mr. Lloyd are endeavouring to play the part of the "knockers-up" of British industry. Let us hope that they will find that the lady is only sleeping and will respond to their call.

WALTER T. LAYTON.

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PREFACE

This book is written as a result of our visit to the United States of America during the last quarter of 1925.

The visit was inspired by the thought that some possible benefit might be derived from a first-hand acquaintance with the American manufacturing industry during a period of unprecedented prosperity in that country and at a time when Great Britain was in the throes of an industrial depression, hitherto unparalleled, which has rendered workless a million and a quarter of our people.

The line of inquiry was mainly directed to those causes which are responsible for bringing about a condition of high wages in industry coupled with low cost of production.

Armed with some knowledge of the British and Continental engineering industry both from the manufacturing and selling points of view, we toured the most important cities of Eastern America, inspected twenty-four manufacturing plants and other commercial organisations and in addition had opportunities of discussing industrial policies and methods of manufacture with many leaders in American life.

Our impressions were briefly described in a memorandum entitled "American Prosperity" which was printed for private circulation and was the subject of

some comment in the British and Continental Press in January and February, 1926. *This book is the direct outcome of the many suggestions which appeared in the Press that the material contained in the memorandum should receive a wider publicity.*

Certain policies of management in industry, not generally adopted by British firms, were found to be in more or less universal operation in the United States. As we believe that the adoption of these principles has contributed more than anything else to the present prosperity of America, they are discussed in detail in the following chapters.

We wish to place on record our appreciation of the numerous facilities and courtesies so freely extended to us during the course of our investigations and to express our thanks to the many Americans who were kind enough to place at our disposal all the information we desired and to give us their valuable time for the discussion of the many points we raised. We also wish to thank the officials of H.B.M. Government resident in America for their generous co-operation and assistance.

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THE SECRET OF HIGH WAGES

CHAPTER I

GENERAL OBSERVATIONS

THE United States of America are now enjoying a period of unprecedented prosperity and from an examination of its causes one is led to the belief that this condition must continue for at least the next few years. While certain minor booms are undoubtedly taking place (such as, for instance, the present high level of land values in Florida and one or two other districts), the industrial prosperity of America is undoubtedly based on a solid foundation. That this period of national well-being is not of a temporary character is shown by the steady increase in Savings Banks deposits. During the last seven years the amount of these deposits has risen at the steady rate of $100,000,000 a year to the present large total of $1,400,000,000. These figures represent almost exclusively the savings of the workpeople of America. Another significant indication of the prosperous condition of the people as a whole is the absence of poverty and street beggars in the large cities.

A study of the general conditions in the country shows that the prosperity is most accentuated in the manufacturing industries which have such a considerable influence on the lives of the American people. The policies and methods obtaining in these particular industries therefore deserve the most careful investigation ; in fact, their successful operation is without doubt responsible for the high standard of living which obtains and the considerable rate of progress now taking place in every direction.

While the chief credit is given to the American manufacturer for the prosperity of the nation, several other factors have undoubtedly contributed, among which may be mentioned the good prices obtained for the crops, the low debt burden and low general taxation, the improvement in the banking services to the community and, last but not least, the far-sighted policy of the Federal Reserve Board in not allowing a credit expansion based on the gold influx which has taken place in recent years. This latter factor has been responsible for preventing the rise in the general level of prices which was anticipated by many European authorities.

Industrial enterprises have succeeded by virtue of a *strict adherence to* a few cardinal principles of management, some of which are the direct outcome of the scarcity of labour. America has hit upon the secret of prosperity owing to the fact that the scarcity of labour forced her, out of sheer necessity, to adopt time

and trouble-saving devices. On the other hand, in many quarters in Great Britain the prosperity of America is attributed to the wealth of her natural resources, her considerable home market and the influx of gold.

Prosperity is measured by the ratio of wages to the general level of prices; that is to say, even if wages remain constant, a fall in the price level represents an increase of prosperity. A people may also be prosperous when high wages co-exist with high prices, provided that the ratio of the former to the latter is high. Such a condition is usually found in a country rich in natural resources but devoid of any important manufacturing industry, the natural resources taking the form of agricultural products or minerals which are required by the rest of the world. Ceylon affords a typical example of such a country. For the last few years this island has been comfortably prosperous on account of its exports of tea, coconut products, spices and, more recently, rubber. Coolie labour has been fully employed at high wages, while the prices of commodities have also been high owing to the fact that they are mostly imported; even the staple food of the population, rice, has to be imported.

The condition of high prices coupled with high wages, however, is most certainly not the case in the United States to-day.

It must be clear that a condition of high wages with

low commodity prices represents a state of considerable prosperity. In America during the last few years the ratio of wages to commodity prices has steadily increased and it is evident that this has been brought about by lowering the costs of production of manufactured articles, lessening costs of transportation of all goods by increased efficiency and by the elimination of waste. The recent marked increase in prosperity in the United States is therefore due more to the last-mentioned causes than to indigenous natural resources. Providing that costs of producing manufactured articles are sufficiently low it is possible for any country to attain prosperity even though that country possess no natural resources and is entirely dependent on the outside world for the supply of the raw materials.

Much is made of the considerable home market of the United States as a cause of their prosperity. The home market of America increases hand in hand with prosperity, for the increase in the proportion of wages to prices of goods provides the people with greater purchasing power. The considerable home market of America is not a *cause* of prosperity, it is an " accessory at the fact."

The low costs of manufacturing goods in America coupled with the high wages paid to the workers engaged in the industry have astonished the world. Abundant proof is available to show that it is possible continually to reduce prices of manufactured goods to the con-

sumers while at the same time increasing the wages of the producers. The question may well be asked how it came about that the United States, a comparatively new manufacturing country, now leads the world in successful industrial methods whilst having, in addition, such complete harmony between worker and employer.

Mr. Henry Ford embarked on a bold line of policy which embodies the fundamental principles of management in manufacture already referred to above. Mr. Ford has provided the public with a useful article the price of which has been steadily reduced, regardless of competitors' prices. At the same time he has provided his workers with wages higher than those paid anywhere else in the world while he himself, not seeking it as his first motive, has received the reward his enterprise deserved.

Other enterprising employers were quick to learn the lessons from Mr. Ford's amazing success and it did not take them long to realise that this success was due to the operation of a managerial policy which was applicable to spheres of industry other than that of motor-car manufacturing. So it came about that the application of those principles gradually spread throughout the greater part of manufacturing, commercial and agricultural America to the general advantage of the whole community.

Among the more important of the fundamental principles of industrial management, discovered as the

result of exhaustive inquiries and observation in America, the following emerged:

A. The success of an enterprise is, in a large measure, dependent upon a strict adherence to the policy of promotion of staff by merit and ability only.

B. It is more advantageous to increase total profits by reducing prices to the consumer, at the same time maintaining or improving quality, with a consequent increase in the volume of sales than by attempting to maintain or raise prices.

C. Rapidity of turnover makes for comparatively small requirements of both funded and working capital, i.e. the capital required for shop space (including equipment) and the finance of work in progress.

D. The productive capacity *per capita* of labour can be increased without limit depending upon the progress made in time and trouble-saving appliances.

E. It is better that labour should be rewarded by wages bearing some relation to output rather than by a fixed wage, the amount of the wages earned by any one man being in no way limited. Contrary to the general belief in Europe, high wages do not necessarily mean a high level of prices. It is to the

advantage of the community that the policy of industrial management should be directed towards raising wages and reducing prices.

F. A free exchange of ideas between competing firms should be advocated.

G. Elimination of waste is an essential factor in the attainment of national prosperity.

H. It is important that every possible attention be paid to the welfare of employees.

I. Research and experimental work are of prime importance to progress.

CHAPTER II

PROMOTION BY MERIT ONLY

PRINCIPLE A.—The success of an enterprise is, in a large measure, dependent upon a strict adherence to the policy of promotion of staff by merit and ability only.

THE Americans have never believed in the theory that executive ability is invariably inherited.

It is being found that organisations are more successful when almost complete control is vested in one executive head by the Board of Directors. In such cases the appointing of this head becomes the chief function of the Board who place the future of the concern entirely in his hands. An important result of this policy is that the executive head is relieved of the annoyance, which might otherwise occur, of having to answer criticisms by individual directors prompted by a misunderstanding arising from a superficial knowledge of any particular sphere of the firm's activities. As it is not an easy matter to find an executive capable and willing to undertake such a heavy responsibility, the remuneration must necessarily be high. Since the efficient functioning of the executive head can only be judged by the Board on the trading results of the firm

as a whole, the holder of this office cannot afford to exercise any favouritism in the appointment of members of the staff. Any laxity in discriminating in favour of relatives or personal friends, not best suited to the appointments concerned, would be reflected in the results of the firm's working and in turn would tend to jeopardise the retention of his office by the executive head. An incentive is therefore provided to ensure that the executive head appoints the best available men for the respective positions.

It should be mentioned here that there should be no artificial dividing line between the executive staff and the workmen. Such a division undeniably exists in British industry and it is a relic of the " bad old days " when the workmen worked entirely with their hands and the staff with their brains. As the tendency nowadays is to utilise machinery to replace manual work and for the worker to use his brains more and more in the controlling of machines, it is clear that there is no longer any justification for a dividing line and it should be possible for a workman of the lowest grade, providing he shows sufficient ability, to be promoted without hindrance as opportunity occurs to the highest positions in the firm.

Since the members of the staff fully realise that promotion can only come as a result of ability and efficient functioning, there is less manœuvring and intrigue to gain or retain good positions, thereby reducing

internal strife and waste of time. When mistakes are made or lack of ability is shown, there is no hesitation in reducing in grade or removing the incompetent. It is easier to remove a man who does not efficiently control machinery than to remove the machines. Promotion by merit and ability only, in the case of executives and staff, is equivalent to payment by results and, as will be seen later, is in conformity with the policy of rewarding labour by wages bearing some relation to output.

Since an opportunity to improve his position is so clearly afforded the capable and ambitious member of the firm, the enthusiasm with which he applies himself to his work can be imagined. The anomaly of a situation in which a man occupies a position junior in status to that of a less capable man is, by the operation of the above policy, avoided.

Energy and enthusiasm being the prerogative of youth, it is significant, in industrial America, that the majority of responsible positions are held by comparatively young men and it is found that the average retiring age is much earlier than is the case in Great Britain.

It cannot be questioned that in many organisations in Great Britain the spirit of capable men is often broken by the failure of the management to put the right man in the right place. It is also sadly the case that capable men thus treated, who lack the necessary

fighting spirit, only too often resign themselves to the circumstances, gradually losing their initiative and efficiency.

To reiterate, American executives have no compunction in relieving their organisations of inefficients.

CHAPTER III

SMALL PROFITS AND QUICK RETURNS

PRINCIPLE B.—It is more advantageous to increase total profits by reducing prices to the consumer, at the same time maintaining or improving quality, with a consequent increase in the volume of sales than by attempting to maintain or raise prices.

It must be accepted that, if an article is of utility to the community, the volume of sales will increase with a reduction in price.

Furthermore, if the demand for it is elastic, the extent of the market will increase at a greater rate than the fall in price. For example, if the price of the article be reduced by 50 per cent., the number of people who will be in a position to afford to purchase it will be considerably more than doubled.

As an illustration, the output of the Ford Motor Company from 1908 to 1924 is interesting. In 1908–9 the production of motor cars was 10,660 at a price of $950. In 1924 the production of the same models was 1,993,419 at a price of $290; that is to say, while the price in 1924 was one third of the 1908 price the output was increased 200 times. It is obvious from this that although the percentage profit may be reduced even considerably, far greater aggregate profits are possible.

An increase in output should always lead to a reduction in the manufacturing cost of an article. In the first place, the overhead charges per article are reduced since the rent of ground and workshop buildings, depreciation and maintenance charges, foreman's wages, salaries, rates, taxes and insurance will, if spread over an increased number of articles, represent a smaller proportion of the cost of those articles. Further, there will be a saving in the cost of the raw materials or parts which are "bought outside" if they are ordered in large quantities. Last, but not least, it becomes easier to make use of time and trouble saving devices when larger quantities of materials have to be handled in the shops. A higher output should mean that the business is prosperous and will in consequence expand. It will therefore employ more men and executives so that more ability becomes available for concentrating on increasing still further the efficiency of manufacture.

It will also be found, in most cases, to be more advantageous both from the point of view of a saving in cost and reliability in the source of supply, for the firm concerned to take up the manufacture of parts previously obtained from outside sources. The Ford Motor Company, for instance, makes its own plate glass and grows and harvests its own flax for use in motor tyre covers.

Following the policy of a constant endeavour to reduce the cost of their product the Ford Motor Company took up the manufacture of plate glass after

experiments had proved that, by using more efficient methods, the glass would cost them less. At the same time they relieved themselves of the anxiety of a failure, from any cause, in the previous source of supply.

Incidentally the Ford Motor Company now employs 200,000 workers whose minimum wage is 29s. 2d. a day; this organisation is, therefore, of the first degree of importance in the manufacturing industry of the United States.

It is often thought that the principle under discussion can be applied only to the manufacture of articles which obviously lend themselves to mass production, such as bicycles and sewing machines, and that it cannot be applied to the building of ships, the making of locomotives, the construction of large machine tools and so on. All manufactured articles range from those which are produced by the million to those made by the unit. At one end of the range we have articles such as bolts and nuts and at the other, say, a ship or a house. There is no clear line of demarcation between those which are mass produced and those which are otherwise made.

Everyone will agree that it is desirable to reduce the cost of all manufactured goods; also that those goods which are quantity produced cost less than those which are not. The desired result of reducing the manufacturing cost of as many articles as possible may clearly be obtained by moving them towards the category

representing quantity production and the only manner in which this end can be accomplished is by simplification and a reduction in the number of sizes and kinds of each particular article. Many an article produced in Great Britain is made in several types and sizes so as to appeal to the multifarious tastes of customers. What chiefly appeals to a customer is a low price. By co-operation manufacturers of any particular article can simplify and reduce the varieties to a few standard types. In commerce this process of simplification and standardisation can continue until parts of large machine tools, the bolts, nuts, rivets, girders and plates of a ship or even complete locomotives and houses might be standardised. A certain American locomotive works employing 6,000 men has a capacity for turning out ten main line locomotives a day. Standard steel houses are being built in Great Britain to-day.

American business men have given considerable attention to the elimination of some of the many varieties of manufactured goods. "*The Times* Trade and Engineering Supplement" of January 16th, 1926, published the fact that it has been found, in most of the industries of the United States, that approximately 80 per cent. of the production and sales is on 20 per cent. of the varieties manufactured. Up to 1925, 400 separate and distinct branches of American industry had taken an active interest in the question of reducing types ranging from the manufacture of carpet tacks to farm

implements. It has also been found that there is practically no industry which is not more or less burdened with excessive diversification of products. It is pointed out that simplification is purely an economic movement preliminary to standardisation and that, because of its voluntary aspects, it is manifestly the proper procedure. Striking instances are given of what has been accomplished in this direction :—

> The varieties of car wheels have been reduced from 175 to 4 ; malleable chains from 2,044 to 820 ; clocks from 600 to 80 ; farm implements from 1,092 to 37 ; hammers, axes, etc., from 2,752 to 761 ; paper from 377 to 56 ; paving brick from 66 to 7 ; pipe fittings from 17,000 to 610 ; stove parts from 2,982 to 364 ; toilet goods from 452 to 140.

If the manufacturers of a particular article do not get together for the purpose of reducing the variety of their products, the individual manufacturer is not thereby prevented from taking the matter into his own hands. A British manufacturer of ladders has reduced the number of types and sizes of his products to merely two. His business is run in accordance with the best American practice and although he began manufacturing but two years ago, his output of ladders is now equal to that of any other British manufacturer.

With regard to articles connected with personal or domestic comfort, simplification and standardisation

will only proceed up to the point where sales begin to fall off on account of the monotony of design. In Great Britain we have a very long way to go before that point is reached.

It may happen that an article manufactured by quantity production will become so cheap to the public that an increase in sales would be stimulated, to a greater extent, by paying more attention to improving the quality than by continuing to reduce the price. From the manufacturer's point of view the result to him is just the same. His greater output reduces the cost and part of the resultant saving goes to the improvement of the article, the rest to increased wages and profit.

CHAPTER IV

RAPID TURNOVER NEEDS LESS CAPITAL.

PRINCIPLE C.—Rapidity of turnover makes for comparatively small requirements of both funded and working capital, i.e. the capital required for shop space (including equipment) and the finance of work in progress.

THE advantage to be gained by getting a job done quickly is so indirect that its importance is not often fully realised. The advantage is, nevertheless, quite certain. If, for instance, a job is completed in a works in one hour less than the estimated time, the floor space and machines with their attendant overhead charges are available during that hour to be applied to another job at practically no overhead cost. Further, if all work passing through the shops is speeded up, the whole organisation, including equipment, handles a larger amount of work in a given time. To put it in another way, a given turnover can be handled with a smaller capital outlay.

Provided progress be continuously made not only in the use of higher speed machines but in the more rapid handling of work in progress, it is possible, therefore, on a given capital to increase the turnover without limit. The cost of the continual improvements should

be charged to the depreciation and maintenance fund and not met by increased capital. It is evident that expediting the delivery of products to customers represents a definite cash saving to the manufacturer; in addition it gives a better service to his customers to whom it also represents a saving.

In the application of this policy both the manufacturer and customer have an identity of interests. The prompt delivery of goods in America is chiefly accounted for by the obvious great advantage which accrues to the manufacturers.

A striking result of the realisation of this principle is evidenced by the service of the American laundries which collect soiled linen at 10 a.m. and deliver it laundered at 6 p.m. the same day. To digress a moment, it is interesting to find that the commercial traveller in America carries his personal luggage in a single "grip" which need only contain two of each article of clothing, so that he is able to have a complete change of clothes every day.

CHAPTER V

NO LIMIT TO A MAN'S OUTPUT

PRINCIPLE D.—The productive capacity per capita *of labour can be increased without limit depending upon the progress made in time and trouble saving appliances.*

With the progress of invention and with the greater reliability and accuracy of machines it is very clearly realised in America that no limit can be set to the output which can be attained by one man. It therefore becomes not only important but essential for manufacturers to keep in close touch with inventions and improvements in machinery and, after satisfactory trials, to adopt the improvements with the least delay. The keen desire to keep quite up-to-date in machinery is such an important factor with American manufacturers that what appears to European industrialists to be ruthless and wholesale scrapping of plant is nothing more than a normal means of progress. It is not surprising, therefore, to find that depreciation charges figure largely in the accounts of an American manufacturing business. This is illustrated by the case of the Allied Chemical and Dye Corporation whose real estate, plant, mines and equipment are

valued at $153,000,000. During the year ending 31 December, 1924, this corporation allocated no less than $81,400,000 to depreciation, obsolescence, etc. Incidentally it may be added that the corporation, in the same year, paid an 80 per cent. dividend on its common stock and has, during the last three or four years, freed itself of its prior charge obligations.

American concerns often find it to be more advantageous, when scrapping plant, to abandon the buildings and machinery rather than to incur the expense of dismantling. A little reflection will show that such a procedure can, in some cases, prove to be profitable. Let us assume that a firm A has manufactured a product by a certain process for some years. In the meantime satisfactory trials have proved that the product can be manufactured more economically by a different process. A new company B is formed to manufacture the product by the new process. In order that firm A be able to compete successfully it will probably have to replace its old plant by new equipment. A must, in this case, at once write off the whole of its old equipment. Now we will further assume that company B has set up its modern equipment in modern buildings exactly suited to that equipment. Then company A, in order to avoid saddling its new competitive business with charges representing the expense of dismantling the old equipment, may clearly find it profitable to abandon the old plant and premises and set up anew.

Company A will then enter the field on the same basis as its competitor B. If company A had not hitherto sufficiently depreciated its old plant and premises the complete writing off would involve the company in a loss. It must be clearly understood, however, that this loss, having been made, does not in any way affect the future earning powers of the company.

In Great Britain the importance of depreciating plant as quickly as possible is not realised by the majority of manufacturers and by the Government. Instead of providing manufacturers with an incentive to depreciate equipment quickly, the Government actually penalise them by rendering depreciation charges over and above an average figure of about 8 per cent. liable to taxation. The Government should at least allow a rebate of tax on all money actually spent on improving or replacing equipment and buildings. The revenue would not suffer but would at least be recouped not only on account of the increased profits of the concern in question but also by those of the firm which supplied the new machinery.

With the constant introduction of new machinery, the productivity *per capita* of labour in America is being steadily increased and this point alone is of supreme importance in the examination of the causes which have led to that country's prevailing prosperity. Every business man should give special attention to the output or turnover of each individual engaged in the business

and should be persistent in his endeavours to increase that output continuously. It must not be thought that this policy can be applied only to manufacturing concerns. A stockbroker's clerk can considerably increase his output by making use of calculating and ledger-posting machines. In the painting trade a man's output is to-day being increased rapidly by the adoption of paint-spraying appliances.

At this juncture let us examine the familiar argument that the adoption of "labour-saving devices" makes for unemployment on the ground that, there being a supposedly fixed amount of work to be done, the more work executed by one man the less there is left for others to do. Let us first assume an extreme case and suppose that in a certain works each man is allowed to do as little work as he likes at the standard hourly rate of wages. An order for a locomotive is booked for delivery in six months, it having been agreed between the customer and the manufacturer that the amount of the contract price shall be determined by the total cost of wages plus 100 per cent. to cover overhead charges; all other materials used in the manufacture are to be paid for at cost. Let us assume that the cost of a similar locomotive made in these works, before the management allowed the men to do as little work as they liked, amounted to £6,000, which was a competitive price, the price being made up as to £2,000 wages, £2,000 materials and £2,000 overhead charges

and profits. If each man takes eight hours to do that which he is capable of doing in one hour, it follows that eight times the usual number of men will be taken on in order to complete the work within the contract time.

The wages cost alone, in this case, will therefore amount to £16,000. From this it is quite clear that the possibility of finding a purchaser for any more locomotives at such a prodigious price is remote.

If this policy is allowed to continue, the works will receive no more orders, must close down and throw all its men out of employment.

The above illustration should show that any policy which tends to restrict or reduce output is suicidal.

Now let us see what would happen if the same locomotive works adopted a policy of increasing each man's output with the aid of time and trouble-saving appliances and with the full co-operation of the workers. We shall suppose that each man is provided with an incentive to increase his output and actually accomplishes 50 per cent. more work in a given time.

For the purpose of the illustration let us say that the incentive takes the form of a 50 per cent. increase in wages. It is true that, if the locomotive is still to take six months to complete, it will only be necessary for the management to take on about two-thirds of the number of workers they would normally have required. The wages cost will still amount to £2,000, but since now the number of men, machines and shop space are

reduced by roughly one-third, the total overhead charges will only amount to £1,330 and, assuming the cost of materials to be the same, the total cost of the locomotive will be reduced from £6,000 to £5,330. As this price is 10 per cent. below the competitive level, the company will have no difficulty in filling its shops with locomotives and so will have to employ men to the maximum of its capacity *at the increased rate of wages.*

The Bulletin of the Federal Reserve Board of the United States of America for December, 1925, shows that from September, 1924, to October, 1925, the employment in the manufacturing industries of America increased by 6·4 per cent., but the wages bill in the same manufacturing industries increased during the same period by 12·6 per cent. These figures are based on "a weighted average of relatives for thirty-four individual industries."

The production in the manufacturing industries for the same period increased by 24·8 per cent.

As an illustration of what has been accomplished in the direction of increasing the output per man, the electric power station of the River Rouge Plant, Detroit, is interesting. Here one man only is employed to control the stoking of each battery of four coal and gas fired boilers which raises steam for 70,000 h.p. It should be remembered that the Ford Motor Company, which is always increasing the output *per capita* of its

workers, far from causing unemployment, has increased its pay-roll rapidly to the present enormous figure of 200,000 men and, as already mentioned, the minimum wage amounts to 29s. 2d. a day.

A further instance of high productivity *per capita* is afforded by the Colt Patent Firearms Company, of Hartford, Conn., where, in one of the shops, one man attends to eight milling machines for small parts. Again, at the Lincoln Motor Company's works at Detroit, one shop containing 78 machine tools is operated entirely by twenty-two men. This number includes the necessary supervision and inspection.

To turn to an entirely different type of business, a clerk in the metal currency department of the First National Bank at Boston is able, by means of a machine, to count and pack into five-dollar cartons $4,000 worth of 10-cent pieces an hour. Throughout the organisation of this bank no member of the staff may be seen making hand-written entries of any description, calculating and ledger-posting machines being universally employed.

Since every effort should be devoted to increasing the productive capacity *per capita*, use should be made of the intelligence of every worker and member of the staff by providing the proper incentive. In Great Britain it is unfortunately true that an important asset is lying undeveloped in many industries. This asset is represented by the brains of the workers employed.

Each worker's intelligence should be utilised to the full for the benefit of the industry. In many cases in British industry the worker is not encouraged to use his brains and the chief reason for employing him is to make use of his manual skill. The fact that a worker may have considerable intellectual ability is too often ignored. The progress of civilisation is in the direction of a gradual replacement of manual work by brain work. Under proper management the worker would be convinced that the application of his brain for the purpose of saving his hands would bring him more profit. However much a man may like working at a skilled job, the majority of human beings dislike manual work except for exercise and, although they may not realise it, would prefer brain work in spite of the fact that the latter may be equally strenuous. The ultimate aim of industry should be the complete elimination of manual work. When we arrive at that elysium, "labour" will control the machinery of manufacture with brains.

Apart from providing an incentive for the worker to exercise to the utmost his mechanical skill he should, in addition, be given an incentive to reduce or to eliminate entirely his own manual job by improved methods, devices or machines. In other words, if a worker's suggestion regarding improvements is found, after examination and trial, to be of sufficient value to be adopted, he should be rewarded by an increase in

wages and promotion to the higher position for which he is obviously qualified. In this way progress is made, the business expands and in consequence has to employ more men. The fact that America has taken the lead in time and trouble-saving devices for household purposes is too well known to need any comment.

The term "labour saving devices" is a particularly unhappy one which has been widely misunderstood in Great Britain. Labour saving machinery has come to be regarded as a device for doing away with labour—meaning men. It should rather be thought of as time and trouble-saving machinery. It is machinery for helping the working man to increase his output and his earnings and therefore, under proper management, to raise his standard of living.

Developments in time and trouble saving appliances are mainly in two directions:

(*a*) In the invention of machines to do more accurate and skilled work.

(*b*) In the increased use of conveyers and other mechanical means for reducing the amount of labour required for handling.

The Nankin Mills plant, Detroit, affords an illustration of the former. This is a small factory containing only 29 automatic machines producing the minute parts of magnetos and carburetters. The machines were originally the standard models for four operation work, as supplied by the maker, with a guaranteed

output of 1,000 pieces an hour. The company then applied itself to the problem of increasing the output of the machines still further and by modifying the design, for the purpose of speeding up various movements, were able to attain an average output of 1,560 an hour.

An interesting illustration of the advantage of conveyers is provided by the Flat Rock plant, Detroit, which manufactures 14,500 sets of lamps for motor vehicles a day and employs 570 men. The nickel-plating of the lamp reflectors is effected by means of a simple conveyer system over the dipping tanks, the parts to be plated moving continuously in and out of the various solutions. Only two men are required to supervise the electrolytic process.

The sequence of operations in manufacturing industries should always be carefully studied with a view to reducing transportation and handling charges, from the raw material stage to the packing for delivery of the finished product.

As it is realised that so much can be accomplished by time and trouble-saving appliances and methods, this branch of engineering is given a great deal of attention in the numerous technical colleges of America. Much of the research and experimental work, now so important in American manufacturing plants, is devoted to the study of these appliances and more rapid methods of production.

CHAPTER VI

NO LIMIT TO PAYMENT BY RESULTS

PRINCIPLE E.—It is better that labour should be rewarded by wages bearing some relation to output rather than by a fixed wage, the amount of the wages earned by any one man being in no way limited. Contrary to the general belief in Europe, high wages do not necessarily mean a high level of prices. It is to the advantage of the community that the policy of industrial management should be directed towards raising wages and reducing prices.

It is accepted in America that the higher the wages labour is able to earn, the better it is for the community as a whole, since it enables the working man to raise his standard of living. With higher wages he can afford to obtain some of the comforts of life and these stimulate his desire for more comforts and even luxuries. The logical outcome of this state of things is that he is incited to greater effort in his productive capacity. To the few who suggest that high wages lead workers to squander money in "riotous living" and take for their authority the state of affairs during the Great War, it should be pointed out that the intense national strain and anxiety caused all classes to seek relaxation

to a degree which would not obtain in normal times. It should merely be necessary to remind these cynics that nothing untoward happened during the prosperity of England in the latter half of the nineteenth century when real wages were steadily rising.

In Great Britain it is felt, in some quarters, that high wages are not desirable. This attitude is partly accounted for by the belief that high wages must mean high prices of commodities. In Europe, wages are generally taken to be the price paid per week for a supposedly fixed amount of work done. Not sufficient account is taken of the fact that one man's output may be considerably greater than that of another. As variations must occur in the output of different workmen according to their ability and attitude, a weekly wage is in reality, therefore, not the price of a fixed amount of work done. Further, owing to the slow progress that is made in Europe in the adoption of time and trouble-saving devices, the weekly wage is, roughly speaking, a more or less constant proportion of the general level of prices of manufactured goods. In other words, the weekly wage level and the price level rise and fall together. As proof that this close relationship between wages and prices is accepted in Great Britain, it is well known that clauses are often inserted in contracts whereby the ultimate contract price shall be increased or decreased according as the level of wages has risen or fallen during the execution of the contract,

so that both contractor and client may be safeguarded. If all the labour engaged were paid in some proportion to output, any rise or fall in its weekly earnings would not affect the contract price.

In a country where labour is paid by wages bearing some relation to output it is possible for the general level of wages to increase while the general level of prices remains stationary or even falls. This is borne out by what has actually taken place in the United States of America during the last five years.

Mr. Hoover, the United States Secretary of Commerce, in his annual report made public on 29 November, 1925, quotes the Department of Labor index of the movement of wages and prices from 1920 to 1925, using the 1913 levels as the unit of 100. The price percentages represent the average wholesale prices of all commodities:

Year.	*Wage Rates.*	*Prices.*
1920 ..	.. 199	226
1921 ..	.. 205	147
1922 ..	.. 193	149
1923 ..	.. 211	154
1924 ..	.. 228	150

"A comparison with similar British indexes," the report continues, "gives striking evidence that these results are peculiar to the United States."

Again taking the 1913 levels as the unit of 100, the corresponding figures for Great Britain are as follow :

Year.	*Wage Rates.*	*Prices.*
1920	230	283
1921	260	181
1922	200	159
1923	170	162
1924	170	174

It is seen from the first table above that the general level of wages in the United States was higher in 1924 than in 1920, while the wholesale prices were lower. The American wage rate had risen in 1924 to 128 per cent. above pre-war level, while the wholesale price level had dropped from 126 per cent. to 50 per cent. above pre-war level.

The British figures quoted in the second table show that the wage level had *dropped* in 1924 to 70 per cent. above pre-war, while the wholesale price level had also dropped to 74 per cent. above pre-war and they bring out the close relationship between the wage level and the general price level, as already stated.

A study of the figures relating to the prosperity of Great Britain during the last half of the nineteenth century will show a similarity of wage and price movements to those now taking place in America.

In *The Times* of 20 January, 1926, the City Editor pointed out that "the trade cycle chart compiled by Mr. Joseph Kitchen, F.S.S., shows that in 1850 the

overseas trade of the country was 171 millions sterling, or £6·2 per head, real trade being £10·8. In 1900 the respective figures were 877 millions, £21·1, and £21·1 Wages in 1850 were 100 and in 1900, 179 ; real wages rose in the same period from 54 to 100. Incomes assessed for income tax rose from 259 millions to 867 millions—£10·5 per head to £20·8 per head. Prices of commodities, according to Sauerbeck, fell in the same period from 77 to 75. According to the Board of Trade calculations, wholesale prices fell from 135·6 in 1871 to 100 in 1900."

In a country where the ratio of the wage level to the price level is stationary or decreasing, the state of prosperity is also stationary or waning. An increase in this ratio means a rise in the standard of living of the people. Any rise in the standard of living provides a country with an increased home market, the importance of which should not be under-estimated. If, for instance, through effective education and increased productivity, the people of India desired and were enabled to purchase more manufactured goods to the value of but one rupee per head of the population per annum, sales of manufactured goods would increase by £23,000,000 a year in that country. Primarily the wealth of a country depends on the productivity of its population. Therefore the adoption of any means tending to increase the productivity *per capita* will increase the national wealth. In the case of a back-

ward country progress must be made in education along with progress in productivity, in order to ensure that the increased wages earned may be utilised by the workers to the best possible advantage. If insufficient progress is made in education, higher wages will become less of an incentive to greater output. In other words, a worker, earning sufficient money in two days to maintain his old standard of living for a week, would have no object in working for the remaining four days. For progress to be made in civilisation, it is necessary for the standard of living of the community to be continuously raised. Conversely, any reduction in the standard of living is a retrogression in civilisation. This explains the great antipathy of workers to a reduction of real wages.

Agreements which bind wages to a sliding scale depending upon the level of commodity prices also fix the standard of living and are thus a bar to progress. It should therefore be evident that any employer who attempts to reduce the real wages of his workers is not only committing a wrong towards them but is indirectly performing a disservice to the whole community. Should he be successful in accomplishing his object, which is unlikely, he is bound to cause a justifiable and deep-seated discontent among his men which will soon react to his disadvantage.

So far, we have seen how the application of this principle is of advantage to the community. Turning

to the employer it is fairly obvious that, if his men are paid a wage bearing some relation to their output together with a clear understanding that no limit will ever be placed on the actual weekly earnings of any individual, an incentive to work is provided of no mean importance. The need for supervision will be reduced while the men will be encouraged to use their ability in the direction of devising more efficient shop methods and eliminating waste. Nothing but the greatest harm can be done by cutting the piece rate, once established for a particular job, unless there is a change in the method of manufacture as this at once destroys the confidence of the men in the employers and proves that the employers do not desire to see high wages. From the men's point of view they are happier at their work because they are in a position to increase their earnings in accordance with the aptitude they possess. It is found that workmen in America are happy and contented and are not rushed in their work against their will.

Various criticisms regarding the trying conditions under which the men work in the Ford Plants in America are frequently advanced. While a first impression leads one to think that each man is working under tremendous pressure, close examination of the individuals at their work shows this not to be the case ; in point of fact, one is actually deceived in that it is the rapid movement of the machines and parts

manufactured and not that of the men. It is the machines that do the work—not the men.

Another objection frequently put forward is that the majority of the men at these works suffer mentally from the extreme monotony of a simple repetitive job. It is the policy of the Ford Company to save human effort by the use of machinery. Any man who objects to his particular job on account of its mechanical nature and prefers to use his brain for devising an appliance to replace his exertions is rewarded and promoted. The exercise of inventive ability, however small, meets with every encouragement from the company. In any case, if a man dislikes his job, the company will always move him to one he prefers.

The contention that the men are restricted to uncongenial and monotonous work is, for the above reasons, completely unjustified. With regard to the argument that the men are turned into machines, it need only be pointed out that the Company's policy and practice are exactly the reverse.

The importance of not allowing an artificial limit, in any circumstances, to be placed upon the possible earnings of any one man cannot be too strongly emphasised.

The rates for piece work and the job rates for premium bonus systems, such as the Halsey-Weir, once made should be maintained. Should any alteration take place through the introduction of a new method of

manufacture or through a change in design the new rate should be so adjusted as to enable the worker, to earn at least as much per hour under the new rate as before.

The application of this principle should result in concentrating the energies of both management and workmen upon the same objective. The identity of interests thus established leads to an improvement in the relations between employer and employed and results in close co-operation between them for the benefit of the enterprise.

The General Electric Company at Schenectady, N.Y., have a Works Council composed of officials and a body of workmen. Meetings are held once a month, with the General Manager in the chair, when all questions relating to shop methods and practice, rates of pay, hours of labour, welfare and other items are discussed. The Council consists of three or four officials and one representative, who is elected by secret ballot, for every hundred men. This Council is a proved success and it has dispelled many illusions the men previously held regarding overhead charges and costs which are very fully discussed at the meetings.

When the above state of affairs is firmly established in a business the employees clearly understand that the raising of wages forms part of the policy of the employers aiming at larger profits through increased turnover. Conversely, any organisation of labour which has for its

policy the restriction of output, or the raising of wages with no regard to output, aims a direct blow at the prosperity of industry and therefore of the men themselves.

The result of adherence to a policy based on the principle under discussion will be the achievement of one of the aims of organised labour unions. Together with the absence of disputes in industry comes the disappearance of extreme socialistic and Bolshevik agitations. The success of the general policy of industrial management in the United States of America is a complete answer to extreme Socialism and Bolshevism.

CHAPTER VII

RIVAL FIRMS SHOULD EXCHANGE IDEAS

PRINCIPLE F.—A free exchange of ideas between competing firms should be advocated.

THERE is an advantage to all concerned in fostering free intercourse between rival firms engaged in the same industry. The principle of exchanging ideas has been adopted to a large extent in America and results almost, in effect, to co-operation in the production side of business and in the evolution of the best marketing methods. The Sherman law made it illegal for firms to combine for the purpose of fixing prices or otherwise forming a trust. In the United States the view is strongly held that the maintenance of fixed or monopoly prices is disadvantageous, not only to the consumer but also to the producer, since it tends to destroy the individual initiative of producing companies and this in turn leads to inefficiency. The American manufacturer's policy is to increase the extent of his market by a continuous reduction in the price of the article. This object would be completely defeated by price maintenance of any sort. It must be understood that the co-operation referred to is not in any way concerned with the fixing or maintaining of prices but is for

the fostering of trade on a strictly legitimate and competitive basis. The spirit of facilitating an exchange of ideas and experiences in any one branch of industry is responsible for the growth of the numerous conventions and business societies in America such as those devoted to advertising, leather manufacturing and motor-car dealing.

Such conventions and societies of salesmen representing a particular industry are able to keep that industry posted on any changes of fashion as soon as they are detected by the salesmen, so that the individual manufacturers may lose no time in framing their manufacturing programmes with the object of accommodating themselves to such changes in the trend of public demand.

Elimination of waste in an industry is considerably facilitated by co-operation. Everyday commercial documents can be simplified and standardised to the advantage of the marketing side of business while the statistics of sales of various articles will be of much assistance to the production end of industry.

Two important firms of agricultural machinery manufacturers in America co-operate on the production side of business to a marked degree. When one firm produces a new machine the other buys a sample and asks for detail drawings which are supplied without hesitation. The latter firm is thus enabled to examine the machine to see whether or not it could effect any improvements. This courtesy is invariably reciprocated.

Engineers from the one company's works visit the shops of the other to study shop methods, the output of machines and many other details. The co-operation is maintained in the true spirit because both firms fully realise that swifter progress can be made in the agricultural machinery business to the obvious advantage of both firms since there will be an increased general demand for agricultural machinery in proportion to the progress made in the improvements to machines.

The Ford Company possesses its own plate glass factories. This company was the first to produce plate glass by the continuous process, thus enabling them to reduce the cost of production from $1·25 cents to 35 cents per square foot. The formula giving the proportions of the ingredients, soda ash, silica sand, limestone, etc., which comprise the furnace charge and every detail of the process are open to the inspection of all and sundry. The manager of this factory explains that, if anyone can improve upon the process and manufacture the glass himself for sale at a reduced price, the Company would scrap their own plant and purchase from the new producer, thereby effecting a saving.

An efficient management has nothing to lose by not keeping secret its commercial processes but may on the other hand derive benefit from the suggestions or activities of outside experts who are allowed to make themselves acquainted with the processes.

Where this spirit prevails throughout a country the advantages which it will gain through the resulting rapid dissemination of knowledge will undoubtedly give it a lead over other industrial nations in the direction of improvements in the methods and processes of production.

CHAPTER VIII

ELIMINATION OF WASTE

PRINCIPLE G.—Elimination of waste is an essential factor in the attainment of national prosperity.

None will deny that, as there is so much room for improvement, elimination of waste in a firm, industry or country can be highly profitable. The driving force applied to this particular line of progress in America is too often looked upon by other countries as a fetish. As it is the line of least resistance there is a natural tendency to slip into wasteful methods. Such methods and conditions will remain a drag on progress until it is realised that the benefits which will accrue fully justify the positive concentration of effort on the part of industrial executives. It often happens that a firm continues almost oblivious of a steady or even growing wastefulness in its organisation until one day it has suddenly to wake up to the facts and make drastic cuts and economies which are not always given careful consideration and which might consequently become "uneconomic economies." A small capital expenditure is sometimes necessary to put into effect a new process or method when scrapping the old or obsolescent one for the purpose of eliminating a waste. If only

spasmodic attention is given to cutting out waste and capital expenditure is involved, it is not usually foreseen and is not therefore included in the budget. Every executive member of an organisation is assumed to pay attention to economy but what is everybody's job is nobody's job. In many organisations the need for making economies is of sufficient importance to deserve the whole time and energy of an executive member of the staff.

A visitor to the United States sees many striking instances of the degree attained in the elimination of waste. It is not only to be found in the industrial plants but it is evident on all sides of the observer; in the streets, in the homes, in the hotels, public places and institutions and in every branch of commerce in the country. Avoiding waste and conserving time, energy and space constitute an integral part of American national life and government policy.

Let us take a comparatively trivial example. The city of New York has three telephone directories. The volume covering Manhattan and the Bronx is one inch wider, three-eighths of an inch longer and one quarter of an inch thicker than the London telephone directory. The Manhattan volume contains 1,318 pages of subscribers' names and addresses in addition to 10 pages of advertisements, while the present London directory has 1,302 pages of subscribers' names and addresses together with 7 pages of advertisements, the former

volume weighing 4 lbs. 11¾ ozs. and the latter 4 lbs. 4¾ ozs. Each book contains 100 names per column. It is remarkable, however, to find that, whereas the London directory contains 260,400 entries, the Manhattan volume contains more than twice that number—the figure being 527,200—*printed in the same size of type.* The following extracts from the two books are true to scale, the first from the London and second from the Manhattan book :—

Museum .... 3900 Johnstone W. G., Manfctring Jeweller 33 Percy st W.1

Johnstone Co The advtg 1270Bway. PEN sylvia-7781 | Jonas Alberto studio 19 W 85....SCH tyler-1044

If the London telephone authorities rearranged the setting and used reasonable abbreviations to save space, they would save the purchase of 500 tons of paper per annum in addition to the cost of transporting that weight over the London area and would not be put to the expense of binding 170,000,000 leaves per annum. These figures represent the extent of the present annual waste provided only that the number of subscribers does not increase. If, however, the number does increase, the waste will increase in proportion.

As already mentioned American industry has taken a big step in the direction of waste elimination by reducing the number and different qualities of an article and by dispensing with the unnecessary varieties of

manufactured goods. Various commercial interests have been co-ordinated for the purpose of cutting out much wasted effort by adopting greater uniformity in the preparation of specifications, bills of lading, warehouse receipts and other everyday commercial documents. A further economy resulting directly from this procedure is the steady reduction of the expenses of litigation. Owing to the cost and length of time taken up in litigation there is, in America, a movement afoot to stimulate more and more the settlement of disputes by arbitration. The extent of the waste arising from industrial strife between employers and employees in Great Britain is well known.

In this sphere it must be admitted that the United States were the first to realise the true importance to a nation of the elimination of waste and the conservation of valuable time and space to which they have devoted themselves wholeheartedly.

CHAPTER IX

ATTENTION TO WELFARE

PRINCIPLE H.—It is important that every possible attention be paid to the welfare of employees.

It is the duty of a firm by its shareholders to extend its activities in every direction within its power which will promote the prosperity of the concern. A manufacturing firm is made up of men and machines. The firm's organisation invariably makes provision for the tender care of the machine to ensure that it will give of its best. One man's productive capacity includes that of the machine or machines he controls. How much more essential it must be, therefore, strictly from a business point of view and quite apart from humanitarian motives, to ensure that the man shall work in congenial and clean surroundings, free from discomfort and avoidable dangers of accident, so that he, too, may give of his best.

In what a different spirit will a man go to his work in the morning if the conditions under which he works are attractive and comfortable rather than dark, cheerless, dirty and noisy. It is for this very reason that the Managing Director sits in a swing-back chair in a comfortable office with the door marked " Private " to prevent unnecessary interference, a cheerful fire, a

carpet to deaden noise and bell-pushes to save him the time and trouble of walking about.

A firm should look after its men and increase the welfare services to them almost up to the point—but not actually reaching it—which might be regarded by the men as interference with their personal freedom.

Among the many directions towards which attention to welfare work should be directed may be mentioned "Safety First," adequate first-aid facilities, reduction of noise, adequate lighting of workshops, cleanliness of the works and offices, cheerfulness of foremen and officials, reduction of the amount of human effort in work, provision of suitable accommodation for workmen's private belongings and reasonable allowances for vacation.

The consideration given to the welfare of the workers at many industrial plants in America is most impressive. There is much propaganda for "Safety First." Employers have found it to their advantage to go to the expense of adopting safety devices on machines. On presses and shears, for instance, one finds it is necessary for the workman to use both hands to operate the control switches, so that it is impossible for him to have his hands caught in the machine.

Statistics have shown that the adoption of safety devices alone has resulted in a marked diminution of absenteeism on account of injuries. In the building of the Pyramids, when several thousands of labourers were

required to haul one slab of stone, the absence of one worker from his place in the team was of little consequence to the task-master. In modern times, however, when the worker can be paid high wages on account of his high productivity, his absence is consequently a matter of great concern to the employer.

It will be acknowledged that when wages rise in a locality immediate advantage is taken of the fact by the local tradesmen who raise the prices of the necessities of life accordingly. Increased wages are of little use if the prices of foodstuffs go up in proportion. The workers are thus deprived of the benefit accorded to them by their employers. Such was the case in Detroit some years ago when the first substantial increase in the wages of the Ford workers occurred. The Company was quick to anticipate any unfair advantage taken by the shopkeepers which would negative the end the Company had in view, namely, the raising of their workers' standard of living. This Company immediately set up their own provision shops throughout the works, bought the foodstuffs wholesale and retailed them to the men on a profitless basis. This facility has been continued ever since and to-day the Ford workers find it greatly to their advantage to make their entire household food purchases at the stores provided in the works. Incidentally, it may be mentioned, the men obtain a good midday meal for 15 cents (7½d.) and it should be remembered that the minimum

daily wage is 29s. 2d. It is significant that the turnover of these provision stores is no less than $9,000,000 a year.

As an instance of what can be accomplished in the direction of general cleanliness, the example set by the same company might again be quoted. The floor of the boiler house at the River Rouge plant, Detroit, is not only spotlessly clean but the floor compound is even highly polished, while the stokers themselves wear white cotton suits and white canvas shoes.

At the same plant even the blast-furnace operators work in perfectly clean and dustless surroundings. In the foundry the floor is kept clean, as the sand required for moulding is supplied by enclosed overhead chutes and at the filling points surplus sand falls through gratings in the floor.

In many American factories it is noticed that dust from grinding machines and emery wheels is not allowed to disperse into the workshop but is withdrawn from the macnines by draught tubes. The sawdust from woodworking machines is disposed of in the same way.

Attention to the welfare of employees builds up an *esprit de corps* in an organisation and provides it with a 'soul.'

Welfare is a duty owed by all employers to their men for whose livelihood and well-being at their work they are solely responsible. The expense is trivial but the reward is great.

CHAPTER X

IMPORTANCE OF RESEARCH

PRINCIPLE I.—Research and experimental work are of prime importance to progress.

In Great Britain we are apt to look upon research work as the exclusive privilege of the more advanced classes of our technical colleges and scientific institutions. Moreover, the man in the street considers research work as the hobby of the " highbrow " scientists who work in a world very far removed from everyday life and that it is the exception rather than the rule that a scientific discovery has any practical application. Those scientists who do not stand aloof from commerce tell us that they work for the future rather than for the present and that, while their work may have no immediate application or value, future generations will be able to make profitable use of their discoveries. Scientists feel the need for research since they realise how little they know of their subjects and what great advances might be made as a result of experiment. A little reflection will show us how small is our knowledge of the subjects engaging our daily attention in every sphere of activity. Does the profitless coal owner, for instance, feel that his methods of coal-getting are perfect, and that research

work offers no prospect of an improvement in the situation? If he does, he should pay a visit to a certain Scottish colliery where he will find men, working at the face of a seam only 18 ins. thick, turning out over 8 tons of coal per man per day compared with the average for Great Britain of 17½ cwts. per man per day. Does the building contractor who is to-day erecting a large house in Regent Street and who is employing ten men in a row to pass bricks from a lorry into the building, think this is the most efficient means of moving a load of bricks a distance of some fifteen yards? If he does, he should witness the erection of a new building in the City of London where bricks are moved from the lorry by means of a conveyer, only two men being required—one at each end.

We must wake up to the fact that everything we do is inefficient. Who is to investigate improvements in method or process? In industry the opportunity presents itself more than in any other sphere of activity, since it contains in its ranks men of scientific training.

It is accepted in America that the path to progress and prosperity primarily lies in the reduction of costs chiefly by means of the greater and greater application of time and trouble-saving devices, new processes and the improvement of the means of transportation. Progress, clearly, can only be accomplished by research. It is of such importance that American industrialists are now concentrating a great deal of attention on

research and experimental work ; moreover, they devote considerable sums of money to this cause. The well-known engineer Sir Charles Parsons says that, over and above keeping plant up-to-date, from one to three per cent. of the capital must now be spent on experimental work if engineering firms are not to fall behind in the race. American executives scour the world in order to obtain the best ability in the fields of research in which they are most interested. So much success has attended the efforts of the research departments of some of the larger American firms that they have become world-famous. The laboratories of the General Electric Company at Schenectady produced, *inter alia*, the tungsten filament lamp and the Coolidge X-ray tube.

The work of the research and experimental plant of the Ford Company at Dearborn, Michigan, is truly amazing. These laboratories, after exhaustive and costly experiments, discovered that it was more economical, taking into account cost and strength, to use flax rather than cotton in the manufacture of the body of tyre covers. The discovery has resulted in the establishment of a new industry. The Company now grows its own flax at Dearborn. The crop is harvested, spun and woven into covers at the Detroit factories. It is interesting to find that the same department is now investigating the growing and manufacturing of its own rubber in order to become independent of the monopoly exercised by the British producers. The

Company owns several experimental rubber plantations in various parts of the United States of America, including one of 8,000 acres in Florida. The chief item in the cost of production of rubber in the East is the wages of the large number of coolies employed for tapping the trees. Experience has shown that the latex of a rubber tree cannot be extracted until the tree is from five to seven years old without inflicting permanent injury to the tree. The latex is present, however, in the earlier stages of the life of the tree but in smaller quantities. As no mechanical process has yet been devised which will reduce the large numbers of people required for tapping, if rubber is to be produced in the United States where labour is scarce and wages are high, some way out of the difficulty must be found. The Ford Company hopes to solve this problem by harvesting the young rubber plants every season, the latex being afterwards extracted by machinery. The present experiments of the Company are directed towards the discovery of the species of rubber plant which will give the maximum yield just as far north as possible.

Small American industrial concerns, which cannot afford the expense of a research department necessary to achieve the results they desire, co-operate for their mutual benefit in the establishment of a common experimental institution.

No phase in the life of the workers in industry is too trivial to deserve the attention of the research

department. For instance, it has been found in America that red colours in a room where women work adversely affect the nerves of the employees. The fatiguing effects of the vibration of machines have been analysed so that their importance may be gauged. The hotel companies realise the value of research. A party of several hundred hotel managers are about to visit Europe to make a study of European practice which might prove to be beneficial.

CHAPTER XI

DISTRIBUTION

In both England and America the cost of distributing, among the population, articles of general utility represents a high proportion of the final price paid by the consumer.

Lack of co-ordination is responsible for gross inefficiency in the handling and transport of goods. In England the multiplicity of small retailers is probably chiefly responsible for the heavy cost of distribution. Nine small coal merchants distribute coal in a district which could very often be efficiently served by two. It is estimated that the average quantity of coal ordered by coal merchants amounts to only 4 tons. This fact is given as a reason for the small size of British railway trucks which have a capacity of but 8 to 10 tons. The cost per ton of loading and unloading such small trucks is consequently high. Freight cars on American railways have capacities up to 100 tons. Coal trucks are run on to special sidings over coal dumps and are unloaded merely by withdrawing a single bolt which releases the door in the bottom of the truck. The entire 100 tons of coal then drops between the sleepers on to the dump. An eminent railway authority has given it

as his opinion that the capacity of railway trucks in Great Britain could be increased to 30 tons without affecting railway platforms or any other limitations of the system. Any increase in the size of freight cars will cause a diminution in the handling charges for loading and unloading.

One has only to note the enormous variety of sizes and shapes of the containers, in which articles are packed, to realise the complexity of the system of distribution.

The numbers of different types of vehicles used in road transportation run into hundreds. The speed of traffic in a congested area is determined by the speed of the slowest type of vehicle. In the City of London the horse-drawn type of vehicle is the slowest. The average speed of transportation in this area is therefore that of the horse-drawn vehicle. For short journeys in a congested area, the most economical means of transport is by horse-drawn vehicles because the average speed is too low for the efficient use of motor vehicles. Until horse-drawn traffic is eliminated, transportation will continue to be slow and expensive. The considerable overlapping in the delivery of goods is one of the chief causes of traffic congestion. There is much scope for standardisation of the machinery of distribution, trucks, boxes and other forms of containers.

In their report on marketing, the Linlithgow Committee showed the extent of waste occurring in that

sphere of commerce. The failure to use local products causes needless distribution.

The anomaly of there being too many retailers to serve a certain district could theoretically be overcome by the enterprise of one or two retailers who might embark on a policy of reducing prices to the consumer in order to increase their own turnover. Other retailers who endeavoured to maintain their prices would gradually lose their business in favour of the newcomers, so that eventually the whole of the distribution would fall into the hands of the latter. In practice, however, the chance of the public being benefited by the enterprise of our two friends would be very small since the vested interests of the original retailers, whose policy it may be to maintain prices to the consumer, would lead them to an endeavour to crush out the new enterprise. Unfortunately this action, in most cases, succeeds owing to the fact that a retailer starting in business usually possesses but slender financial resources. It would appear that the defeat of the advantages of legitimate competition by vested interests or rings for maintaining prices might necessitate recourse to legislation for the protection of the consumer.

The whole system of distribution in England is so complex and is so intimately bound up with a diversity of vested interests that much research work is firstly necessary before comprehensive steps can be taken to effect a reduction of waste.

The room for improvement in the efficiency of distribution is so great that it would abundantly repay the industries and interests involved to set up a committee to investigate the whole situation.

CHAPTER XII

COMPANY FINANCE

THE unprecedented depression in British industries during the past few years has caused many firms to deviate from lines of policy to which they should have adhered. The facilities afforded by the British banking system allow a firm of good reputation to carry a moderate overdraft. In Great Britain these facilities are used by many firms to finance work in progress, the overdrafts being considered merely of a temporary nature. When there is a falling off in orders, there is a strong temptation to retain or even to increase the overdraft for the purpose of meeting working expenses as it is the line of least resistance. The overdrafts are still considered to be only of a temporary character as the optimism of the firms concerned instils in them a belief that a return of good trade must come. When depression in the trade persists, the firm is further tempted not to depreciate its plant at the proper rate since the effect would then be to show a reduction in the assets side of the balance sheet and this would, in turn, reduce the value of the backing for any debentures that might have to be issued. As funds become scarcer, there is a further temptation to reduce the expenditure

normally devoted to improvements in machinery and equipment or to the purchase of more efficient plant. If the firm succumbs to this temptation, things go from bad to worse because the earning power of the equipment is now decreased. When the overdraft has reached a sufficiently high figure the bank brings pressure to bear upon the company and insists that the overdraft be redeemed by the issue of debentures or some other form of loan. If the company finds this impracticable, the bank is faced with the alternatives of putting in a receiver or of nominating its own director in the hope that he may pull the company round.

It is to be regretted that many debenture issues made in Great Britain during the period of depression are backed by assets in the form of machinery and equipment which are valued at a figure corresponding to their profit earning power in "normal times" and which do not represent their earning capacity at the time of the issue of the loan. If the purpose of the debenture is merely to pay off bank overdrafts and there is no advantage to be gained by lower interest charges, the company is not in a position, *ipso facto*, to improve its prospects. The operation simply amounts to a change of creditor.

Unless there is a change in the policy of the management, the cost of manufacturing the company's products will tend to increase, in comparison with the competitive level, on account of the use of obsolescent plant.

As this increase in cost normally leads to a rise in the selling prices, the volume of sales will decline. In an endeavour to make sufficient revenue to pay its charges and operating expenses, the company may now be tempted to join a ring, composed of other manufacturers possibly in a similar position, with the object of maintaining or raising the prices to the consumer at a level which will show a good profit if the order is obtained or a small sum to cover tendering expenses if the order is lost. Since the price obtainable for the manufactured article is fixed by the ring, the incentive to reduce the cost of manufacture is not so pronounced as would be the case under free competition and this in turn leads to a reduction of efficiency. If inefficiency increases among the majority of the members of the ring, the tendency of the prices fixed would be to rise, causing a lessened demand from the consumers. It is seen, therefore, that if a firm follows the course described above, each step eventually places it in a worse position in relation to world competition. Economic pressure eventually forces attention upon ways and means for reducing the costs of production.

It is unfortunate that British management is too often deceived by the high proportion that wages bear to the total costs of production and generally jumps to the conclusion that the only way of reducing costs is to reduce the rate of wages and to lengthen the working hours. If wages are reduced and the hours lengthened,

the workers are provided with an incentive to reduce output. If employers *will* reduce wages, they must expect a reduced output from the men since, as it is shown in Chapter VI, wages should bear some relation to output. When output is reduced, overhead charges go up and it is therefore by no means certain that the final total cost of the product will be proportionately less with the same methods of manufacture. It follows that a policy of reducing rates of wages is retrogressive since it is not one which can be pursued indefinitely.

It may be argued that the reduction of wages is necessary merely as a temporary measure and that with the return of good trade the old rates of wages will once again be restored; this argument presupposes that, unless there is a change in the methods of manufacture, clients will be forthcoming to pay the former higher prices—a presumption which may be entirely unwarranted. If an attempt to reduce wages is made for the purpose of securing profits which were not formerly obtainable, it is clear that the employers are aiming at gaining their profit at the expense of the workers' standard of living. Not only is this procedure to be deprecated but it will fail in the long run for the economic reasons already advanced.

Inefficient management is directly and solely responsible for "ca' canny."

Efficient management would resist the temptation to increase the bank overdrafts in consequence of bad

trade. In times of stress it is the first duty of management to concentrate upon the reduction of the costs of manufacture.

In the United States there is a growing tendency to have less and less recourse to banks for advances to finance work in progress. American concerns attach supreme importance to the creation, out of profits, of a reserve fund to enable them to avoid floating indebtedness and with which they can write off uneconomic plant at the proper time. American manufacturing business aims at the complete elimination of outside financial assistance in connection with the manufacturing end, the tendency being to use banks merely as clearing houses for payments and receipts. Not only is this of advantage to the business but it also relieves the banks of the risk of financing, by means of floating or funded indebtedness, firms suffering a setback.

The Bulletins of the Federal Reserve Board of the United States of America show that a large expansion of credit by member banks took place in 1925. Since the beginning of the year the credit extended by these banks increased by $1,300 millions, bringing the total figure up to $30,000 millions. The leading member banks of the system make regular weekly reports to the Federal Reserve Board. Up to 11 November, 1925, the reporting banks showed an increase in loans amounting to $1,151 millions, the bulk of which, however, represents loans on securities, the increase in commercial

loans amounting to only $228 millions. During the last three and a half years the member banks' loans, discounts and investments increased by $4,800 millions, but only $750 millions of this increase of credit was represented by commercial loans. As there has been a large inrcease in the number of new commercial concerns in America, the inference might justifiably be drawn that the tendency is for the average commercial concern to have less recourse to the bank for financial assistance.

CHAPTER XIII

CONSUMPTION AND SATURATION POINT

When a manufactured article has achieved great success, in that the volume of sales has exceeded expectations based on the previous records of the sales of similar articles or on estimates of the probable sales, there are always people ready to say that the saturation point is near at hand. Except in the case of those commodities the demand for which has little elasticity, there is no record in history of the sales of an article reaching saturation point. By saturation point is meant that no further sales are possible even by an improvement in quality and/or a reduction in price. The higher the elasticity of demand for any article, the further do we get away from any possibility of a saturation point being reached.

The rate of increase in production in America is certainly prodigious and the bulk of it is for home consumption. It does not necessarily follow, however, as one might at first be inclined to think, that the saturation point of American home consumption is near at hand. It should be remembered that the standard of living of the people is continuously rising on account

of the upward trend of the wage level. There is, in addition, the high natural rate of increase of the population which is accounted for by the prosperous condition of the country. Authorities have estimated that the present rate of increase of the United States population amounts to 2 per cent. per annum. The extent of the consuming power of over two million additional people per annum can be imagined.

There is yet one more feature of sufficient importance to mention and that is the high percentage of production which is necessary to satisfy the demand for replacements of all kinds due to obsolescence. In the case of the automobile industry it is estimated that about 20 per cent. of the whole annual output is at present required for the purpose of replacements.

The state of congestion of traffic in the large cities of America causes a visitor, at the outset, to take the view that the saturation point in the consumption of motor cars cannot be far distant. While it is obvious that the road space available for motor cars in cities may at the moment be limited it does not follow that any increase in the use of automobiles, in country districts, is thereby prevented. Wider and better roads are continuously under construction to accommodate the increase in motor traffic; it is this increase in traffic which forces the authorities concerned to continue progress in road making. The official returns of the Bureau of Public Roads show that since 1921 there

has been an increase of 100,000 miles of surfaced highways. In the year 1925 alone more than 30,000 miles of roads were surfaced. As the area of the roads is negligible in comparison with the total area of the country, it is clear that there is room for the multiplication and widening of roadways for a very long time to come. Incidentally, capital and maintenance expenditure on roads is not a direct burden on the community in general but is provided by users of motor vehicles. With regard to motor taxation, it is significant that the American motor vehicle user pays only one-fifth of the average annual tax paid by the British user. For instance, in the State of Massachusetts, the owner of a 50 h.p. car pays 25 dollars, roughly 5 guineas, as his annual tax.

The need for wider and better roads in Great Britain has been generally realised but progress in this direction should be accelerated on account of the great advantage of cheaper transport, greater facilities for the distribution of goods and intercommunication of peoples. The present heavy taxation of motor vehicles is a strong deterrent to progress for many reasons. Capitalisation of the annual tax on a motor car is equivalent to a considerable increase on its purchase price. Therefore a reduction in taxation would be equivalent to a reduction in the prices of motor cars and would, in consequence, stimulate sales to the benefit of both the community and the motor industry. In so far as it reduced

unemployment it would be a step in the direction of a return to prosperity. Taxation of motor vehicles should be reduced to a level which will enable the whole of the receipts to be utilised for road making.

It is surprising to find that, in spite of the fact that the Ford Company now produces two million motor cars a year, it has as much as it can do to cope with the demand in the United States alone. Two prominent Ford dealers say, quite definitely, that the potential market for the cars among the farming population of the Middle West is only as yet scratched, although their own sales amount to 10,000 cars a year.

Having regard to the extent of the potential home and export market for British motor cars, the progress it is possible to make in the industry by a continuous reduction in price can readily be imagined.

In comparing America's home market with that of Great Britain, it should be remembered that the population of the United States is scattered over a very considerable area entailing heavy costs of rail transportation, whereas the British home market is really a concentration of people within a very small area. In Great Britain, therefore, the proportion of the selling price of manufactured articles which is represented by the charge for distribution should be very much less than is the case in the United States.

A market for an article is only maintained providing it continues to be of utility. In the case of wearing

apparel and other personal requirements, fashion considerably influences demand. Manufacturers of these particular articles must pay close attention to changes of style so as to accommodate the manufacturing policy with the least delay.

CHAPTER XIV

MARKETS AND PRODUCTIVITY

The extent of a market depends ultimately upon the productivity of the individual, whether he be a settler in New Zealand or a worker in Sheffield. The New Zealand Government buys from Great Britain some electrical equipment, the payment for which must come either from the proceeds of the sale of electric power to the individual in New Zealand or by taxing him. The individual must therefore have a surplus with which to pay for the purchase of the power or to meet the expense of the tax. His ability to do so in either case must depend upon his capacity to provide himself, not only with the necessaries of life, but with the surplus. The extent of the market thus made available to the British manufacturer depends directly upon the productive capacity of the individual in New Zealand. It does not matter whether his wants are electric power from the Government or agricultural machinery for his farm, his ability to purchase either must depend upon his capacity to produce wealth in some form or other. In the same way the extent of the home market in Great Britain depends ultimately upon the purchasing power of the individual, as in the case of the worker in

Sheffield ; in other words it depends upon his productive capacity.

As we have seen in Chapter V, the productive capacity *per capita* can be increased so that the extent of the home market can be increased accordingly. When labour is effective and productivity is high, labour can be paid high wages and it is the high wages which provide a country with a considerable home market, not only for the comforts and luxuries of life but for the equipment required for improvements in the services to the community. No limit, therefore, can be placed upon the extent of a home market, as it is simply dependent upon the productivity *per capita*.

We have seen how the extent of a market depends upon the ability to produce, which also determines the standard of living. For the purpose of illustration let us take the simple case of a community *A*, consisting of only three men. One, by his efforts, makes three loaves of bread a day. The second makes three pairs of shoes a year, while the third is able to make three suits of clothes a year. By mutual trading, each gets one loaf of bread a day, one pair of shoes and one suit of clothes every year. The community now desires to raise its standard of living and proposes to do so by means of increasing its productivity *per capita* by improved methods. The baker is now able to produce the necessary three loaves a day by working only one-third of the time previously taken, so that he is now

in a position to devote two-thirds of his time to making, let us say motor-cars, of which he produces three a year.

The other two men by their increased productivity can now produce nine pairs of shoes and nine suits of clothes respectively; in other words, they have all trebled their rate of output. The community trades mutually as before. The baker still receives one suit and one pair of shoes a year in exchange for two loaves of bread a day, but he is now able to barter a motor-car for two extra suits and another motor-car for two extra pairs of shoes a year. The shoemaker and tailor likewise exchange their products. Now, therefore, each member of the community is able to obtain his loaf of bread a day, three pairs of shoes, three suits of clothes and a motor-car every year, and they have thus raised their standard of living.

Let us suppose that the natural resources of this community cannot provide the raw materials at a greater rate than heretofore, but that a further supply is obtainable from a neighbouring community, *B*. It is therefore impossible for our three friends to raise their standard of living any further unless they increase their own productivity to such an extent that, measured in terms of raw materials, the cost of producing suits, shoes, etc., will be low enough to enable them to be sold in community *B* in competition with similar goods manufactured by community *B*; there is, therefore, nothing to prevent an increase in the standard of living

of these three men, so long as they continue to increase their productivity. They will continue to export their manufactured goods in exchange for raw materials and, provided their cost of production is sufficiently low, they will be able to obtain a profit from community *B* in the form of luxuries. The home market will then, of course, continue to expand. If part of the profit were taken in the form of imported food, community *A* could add to and support further members.

Let us suppose that this takes place and that the increased population of *A* takes up the manufacture of a wide variety of articles. Community *B* will naturally wish to copy the manufacturing methods of *A* in an endeavour to replace the imported goods by those manufactured in their own country. Community *B* will begin to import machine tools and other manufacturing equipment from *A*. They will also send their engineers to community *A* to study the methods of manufacture. *A* owes the advantage it has over *B* in cheap manufacturing methods to the fact that it is sufficiently ingenious to devise machinery of manufacture which reduces the cost of production, and not merely because it possesses certain types of machine tools and certain methods of manufacture. It follows that if *A* continues to possess an ingenuity superior to that of *B*, the mere copying of *A*'s processes by *B* will not enable *B* to be in a position to compete with *A* on equal terms. *B* will, on the other hand, lag

behind *A* in the adoption of improvements in methods of manufacture owing to their inferior ingenuity. *A* will therefore only continue to prosper so long as it adopts the improvements resulting from its superiority. If, for any reason whatsoever, *A* is deprived of the facilities for applying its ingenuity to cheaper processes, a time will come when *B* will reach the standard of *A* in manufacture. Such a situation will cause a falling-off in the export orders received by *A*, which will in turn give rise to unemployment.

Since the food for the increased population of *A* still has to be imported, the falling-off in its export trade is of very serious moment. In addition, the productive members of *A* must support their unemployed brethren, causing, in consequence, a lower general standard of living. Since we have assumed *A* to be primarily a manufacturing country, there is only one possible solution to the problem of fostering a return to prosperity. The solution lies in the adoption of improved methods for the sole purpose of reducing its prices of manufactured goods to a level which will assure its sales in community *B*. It may have happened that community *B* has suffered a national disaster such as a war or an earthquake and will, in consequence, have less money to pay for purchases abroad. While these circumstances will make it more difficult for *A* to dispose of her manufactured goods to community *B*, the fact still remains that *A's* only hope of recovery lies

in her ability to sell goods at the low price which *B can* afford to pay.

Great Britain to-day finds herself in an identical situation with that of community *A* as described above. Great Britain's foreign and Colonial markets still remain. It does not matter how poor a foreign country may be, there is a price at which she can afford to purchase British goods provided they are of utility. It is obvious that a country's need for manufactured goods always exists. The demand for these goods falls off merely on account of the fact that she cannot afford to pay the prices asked, unless there is political obstruction which interferes with commerce and economic laws. The Russian market is practically closed to Great Britain on account of such an obstruction.

Machinery and manufactured goods are required by Russia to enable her to produce wealth and until that wealth is produced she will not have the wherewithal to pay for the machinery when it is ordered. In consequence, purchasers in Russia require a three years' credit to enable them to pay for their purchases. It is the business of financial houses to arrange a credit of this nature in order to start the wheels of commerce revolving, but at the present time the political relations between Great Britain and Russia are such that no financial house would be justified in taking the risk.

About a century ago, Great Britain witnessed the beginning of her industrial revolution which followed

the invention of the steam-engine. The manufacturing industries developed slowly through the first half of the nineteenth century and brought great prosperity to the country throughout the latter half of that century, when great progress was made in invention of machines and processes connected with manufacture. In this direction Great Britain made a greater advance than any other country and became known as the workshop of the world. From 1850 to 1900 wages increased steadily while the prices of all commodities, including manufactured goods, decreased slightly over the same period. This record constitutes a proof of the adoption of more and more time and trouble-saving devices which increased the productivity *per capita* of the workers. From 1850 to 1900 the population of Great Britain increased from 20,000,000 to 36,000,000, a striking criterion to the growth of prosperity. Towards the end of the nineteenth century Trade Unionism began to grow in strength. As Trade Unionism grew, the differences between employers and workers became more acute and strikes, lock-outs and other dislocations gradually became more frequent and more serious. At the same time the opposition of the workers to the introduction of time and trouble-saving appliances grew in intensity, so that there was a greater lag between scientific discoveries or inventions and their practical application to manufacturing processes. Other countries which competed with us in manufactured goods and

which did not experience the same difficulties with their workers, were thus able to make practical use of British inventions as quickly, or more quickly, than were British employers. The advantage Great Britain had on account of her greater ingenuity was therefore discounted, since the time lag enabled her competitors to manufacture as cheaply or more cheaply. We see, therefore, Great Britain assumed a less favourable position in the industrial world purely on account of the increasing difficulties between employers and workers.

Official estimates of Great Britain's foreign trade balance for the year 1925 would lead one to believe that progress in industry has come practically to a standstill while America seems to continue the industrial progress, with its attendant prosperity, which commenced in Great Britain at the time of the industrial revolution.

Owing to the lead Great Britain has had, in the past, in developing foreign markets, resulting both from her ingenuity in manufacture and success in colonisation, she possesses an accumulated knowledge of marketing products abroad which is unrivalled.

With the outstanding exception of the automobile industry, America does not claim to be as widely experienced in the fostering of foreign trade, so that, given the same quality and prices of goods, America has a long way to go to compete with Great Britain in the development of selling organisations abroad. For

many years to come the attention of American manufacturers will be centred on their home market, during which time it will not be essential for them to devote the major portion of their activities to securing foreign markets. On the other hand, the fact cannot be too strongly emphasised that the general costs of production in the United States are slowly but surely on the downward grade. Unless other nations can equal their price and quality, the time is not far distant when foreign purchasers will find it advantageous to establish their own purchasing agencies in America itself. From the American manufacturer's point of view his products will tend more and more to sell themselves abroad on account of good quality and low price which will render it unnecessary for him to find his own foreign market. A similar procedure has, of course, taken place in Great Britain in the past. The coal of South Wales, for instance, owing to its good quality and price, has attracted foreign purchasing agents, who established themselves in Cardiff. This, then, is the nature of the danger of which British manufacturers must take notice.

What lack there is of foreign selling experience on the part of American manufacturers has been responsible for belittling their competitive capacity in foreign markets in the eyes of British manufacturers. This lack, however, is entirely outweighed by America's unquestioned ability to produce at low cost and so will certainly not prevent the purchase of her goods abroad.

CHAPTER XV

CONCLUSION

In Great Britain to-day we have one and a quarter millions of our people out of work as a direct result of a decreased demand for our products. Our basic industries have suffered most severely and it is in these industries that unemployment is greatest.

England depends for her very existence on her manufacturing industries and, while at first sight this may not appear to be the case, a little thought will show us that we are more dependent on these industries than upon anything else. All people engaged in commercial transactions, city merchants, dealers, factors, insurance and shipping companies depend upon the basic industries of the country. Professional fees of all kinds come eventually from industry. With regard to those who depend for their sole income on dividends from investments, it should be remembered that a great deal of the capital invested in this country is in the manufacturing industries. In recent years dividends of many concerns have shown a decline and in some cases have disappeared completely. It is clear that most of the people in Great Britain are vitally affected by the prosperity or otherwise of British industry.

We find, therefore, that a depression in the manufacturing industries is reflected in most spheres of our national life.

Among the chief causes put forward for our trade depression are the high prices of our products, the decrease in the world demand for our goods, unfair competition from countries having a depreciated currency, the heavy burden of taxation and the closing of the Russian market. A state of depression brings with it a host of attendant troubles, among which can be instanced the expense of the unemployment grant, increases in local rates and taxes and greater Government expenditure on account of attempts to improve the situation, all of which help to aggravate the position.

Let us examine the causes that are put forward for our trade depression. There is the so-called "unfair competition" from countries having a depreciated currency. Such a country is certainly able to sell its goods more cheaply than another, provided it depreciates its currency fast enough. It can secure all the orders that are open to competition and fill its works, assuming only that the rate of depreciation of the currency ensures a sufficiently low price. It is clear, therefore, that no competitor can hope to secure business in face of competition of this nature.

Export of goods from a country which is depreciating its currency is tantamount to a free gift of part of the wealth of that country, so that an end to this procedure

must come sooner or later. The extent of the time during which the unfair competition can continue depends on the rate of the currency depreciation. At the present time British manufacturers complain of this kind of competition from France in our export markets. No advantage is to be gained by pausing to discuss the situation since, whatever the result of the discussion, no effective measures can be taken by us to improve it. It is therefore a waste of time to complain.

It is generally accepted that the burden of taxation is a serious handicap to the recovery of trade, in so far as less money is available for industrial enterprise. There is not the same incentive to save and more money is spent in luxuries. Many forms of national and local taxation increase the overhead charges of all industrial and commercial concerns. It is in this way that taxation has the effect of raising the prices of manufactured goods. A rise of prices puts trade a step farther away from recovery. This vicious circle can only be broken by a return of good trade or by a reduction in national and local expenditure. It is not within the power of local or national government to cause a recovery in trade, so that the only course open for it to adopt is to make drastic cuts in expenditure.

There has been a decline in the world demand for our products. In a previous chapter an attempt was made to show that, if an article is of utility, a latent demand for it always exists. If the price is too high for the

prospective purchaser, no orders will be forthcoming. The demand may be stimulated and orders will be increased merely by reducing the price sufficiently. It is true that owing to the effects of the Great War the purchasing power of many of our Colonial and foreign customers has decreased; that is to say, a foreign customer requiring a particular article has a smaller amount of money available to purchase that article. If, however, the price we propose to charge for the article is beyond the customer's ability to pay, what money he has available and is prepared to spend is lost to us if the sale does not take place and is permanently lost to us if the order goes to a foreign competitor at a price within the purchaser's means.

As the majority of the engineering products of this country increase the consumers productive capacity, either directly or indirectly, a reduction in the price to increase the sales will raise the purchasing power of the customer.

Russia is not now in a position to buy our products because money is not available for payment. The goods Russia desires to buy and which we are in a position to supply are, in the majority of cases, revenue-producing. The extension of credit facilities to Russia to allow her three years in which to pay for goods is not at present possible owing to the political relations between Great Britain and Russia. The solution of this difficulty is outside the sphere of commerce and is

solely a matter of arrangement between the respective Governments.

Now we come to the suggestion that the high prices of our products are responsible for our trade depression.

Many striking instances where important orders have been lost to Great Britain on account of our high prices are too well known to mention. While our difficulty in meeting world price competition may be temporarily solved by Government action taking the form of subsidising a particular industry, which eventually means an increase of taxation, the position can be rectified permanently only by the initiative of the industry itself, since the accomplishment of a continual reduction in price lies solely within the power of industrial management. Judging by the records available, it would seem that the alternative of State-controlled enterprise provides no solution.

Industrial employers complain that the attitude of the Trade Unions constitutes an almost insurmountable difficulty to progress in industry owing to their policy of "ca' canny" and limitation of output. The Trade Unions on the other hand complain that the employers treat the workers unfairly by attempting to keep down their wages and at the same time are inclined to lengthen their working hours. Trade Unions are also of opinion that capitalism has failed. To assume that capitalism as a system must be a failure is unjustifiable, for in America it has proved to be an unparalleled

success. Trade Unionism is out for better wages and conditions of living for its members. Employers are out for profits. The frequent occurrence of disputes might at first lead one to think that for the one to succeed in its objective, the other must needs fail. America shows us that it is possible for both sides to obtain what they desire. If employers and Trade Union leaders would only realise this fact and cease to regard each other as obstacles to the attainment of their aims, a very great step would be taken towards the rehabilitation of our industries. Neither can succeed without the help of the other. If employers would decide to assist the workers to achieve their objects and if the workers would assist the employers to make their profit, both would find that production would increase and wages rise. This new spirit in industry can only be brought about if each side convinces the other of its genuine desire to co-operate for their mutual benefit. As management has the controlling power in industrial enterprise, the initiative must lie with them.

The growth of the new spirit in American industry is evidenced by the data published by the United States Department of Labour which shows that the total number of industrial disputes has decreased steadily from 4,450 in 1917 to 1,227 in 1924.

Let us take the case of an individual employer who, manufacturing an article of utility, is only able to

employ two-thirds of his workshops and only two-thirds of the men he would employ if his shops were working to full capacity. Let us also assume that his men are Trade Unionists and are paid the standard Trade Union rates of wages. Since his shops are not full, his overhead charges, per article produced, would necessarily be higher than in normal times. The employer decides to cut himself adrift from any ring to which he may belong and, as soon as he is able, to reduce the price of the article in order to increase the sales. Since his financial resources are slender he may not feel inclined to take the risk of reducing the price of his product, as he is not certain to what extent he will be able to effect a saving in the costs of production. He realises that no manufacturing concern can be the perfection of efficiency and consequently investigates his organisation and methods of manufacture with the object of eliminating waste and cutting out uneconomic expenditure. The manufacturer will naturally at first concentrate his attention upon savings which will not necessitate any expenditure of money. He may find his statistical department keeping certain elaborate records to which reference is never made. If this be the case an opportunity is available for reducing a number of clerks together with their attendant overhead charges. There is not a shadow of doubt that careful probing into any organisation, in this country or any other, will bring to light wastes that can be eliminated. Having effected

a saving, let us suppose that the money so saved will be applied to the purchase of devices which will eliminate waste of time and effort in his methods of manufacture. He now informs his men that with their help he intends to increase his production and raise their wages accordingly and, after careful estimating, fixes rates on the basis of payment by results wherever this is possible. The manufacturer is now in a position to apply the savings effected by the further elimination of waste, partly to a reduction in the price of his product and partly to an early increase in the earnings of his men in order to convince them of his genuine desire to raise their wages. As soon as the workers are convinced of the employer's good faith, he will witness a disappearance of any "ca' canny" that might have obtained in the shops. The increase in the men's wages would represent the attainment of one of the aims of the Trade Unions to which they belong.

The employer has in the meantime acquainted the members of his staff of the new policy and informed them of his intention to pay them salaries bearing some relation to the success of the firm's enterprise and this incites them to work more enthusiastically. The reduced prices of his products will bring more orders to the business.

Having set the ball rolling, there is now no further obstacle to the continued improvement in the firm's business, so long as it adheres to the policy of reducing

its prices and raising the men's wages in consequence of an increasing output made possible by the continuous adoption of improvements in the machinery of production.

The argument has been put forward that the success of industry in America is due to conditions obtaining in that country which do not exist in Great Britain, so that the means by which success is achieved in American industry would not be applicable to this country. The statement has been made that "it is a serious mistake to take it for granted that the British workman and the American workman are alike and that what will appeal to one will appeal to the other." Again, we are told that "the lure of money is not so effective with British mechanics as it is with that heterogeneous class which follows the same callings in America." None will deny that workmen of all nations are alike in at least one respect and that is in their desire for high wages. Surely the ultimate object of all engaged in industry is the creation of wealth, for masters and men alike. The failure of management in certain industries to offer "the lure of money" provides the reason for the considerable growth, to its present strength, of Trade Unionism in this country. This shows that the workers have found it to their advantage to look for protection to Unions rather than to their employers. An employer has considerable control over the livelihood of his workers and therefore of the well-being of their families,

so it becomes his responsibility to do everything within his power to ensure that his workers are satisfied. If the workers do not feel quite happy about the intentions of their employers, they must have recourse to other means. Owing to the failure of management, in most cases in Great Britain, to convince labour of the advantages of increased productivity by paying, in some proportion to output, hard cash in wages at the end of the week, the introduction of the means for increasing productivity has been looked upon with disfavour and even suspicion by the workers. For this they cannot be blamed. The Trade Unions have in consequence been driven to the opinion that limitation of output is the only means of maintaining wage rates and employment.

If we pause for a moment to consider the enormous amount at present necessarily paid out of wages for the maintenance of Trade Union organisations throughout the country and the large body of permanent officials engaged in the looking after workers' interests, it will be realised what a large amount of money is lost to the workers by this expenditure. The loss would be eliminated under conditions of industry controlled by efficient management.

In Great Britain progress in industry appears to have come to a standstill and it has been left to the management of American concerns to continue the industrial progress which originally commenced in our own country. America has really stumbled upon the secret

of success owing to the fact that the scarcity of labour forced her, out of sheer necessity, to concentrate on the adoption of time and trouble-saving devices. In Great Britain we have never experienced this scarcity of labour. We are fortunate in having a quality of labour second to none. Our workmen are well educated, intelligent, respectable and respectful, honest and conscientious. Moreover we have in our people, apart from physical fitness of the first order, talent, unfortunately mostly latent, in the shape of initiative and ingenuity and a determination to face every trouble we can dig up. We are told that the best workmen in industrial America are British. The average American finds it difficult to understand why it is that a British workman who has failed to make good progress in England makes such a success in America.

Taken altogether, the sterling qualities of our workmen represent a national asset the extent of which is neither fully realised nor fully developed.

For progress to be made in a business, not only must every worker and every member of the staff be provided with an incentive, but first and foremost the owner himself must be keenly desirous of increasing his own profits. If the prospect of increased profit does not act as an incentive to the employer, the whole business is exposed to danger. There are certain employers in Great Britain who feel that, as their businesses provide them with a comfortable living, they need not exert

themselves to extend their activities with the object of increasing their profits. The fact that such businesses continue to exist is a criterion of the widespread laxity of management. Keen competition is necessary to stir up such employers to activity. Most of us have met the charming old gentleman who is the head of an old-established concern which experiences no great change in the amount of business done from year to year, except perhaps a slow and steady decline. We know the gentleman who goes to his office about four days a week, starts work at 10.30 a.m., spends two hours at lunch and his car takes him away from the comfortable but dismal office at 4.30 p.m. This is the type of employer who has neither the inclination nor the energy to extend his business. Let us suppose he is a manufacturer and a competitor begins to make reductions in the price of his products. Our friend is now faced with the alternative of following suit or must be prepared to receive fewer orders. If the competitor is able continually to reduce his prices by reducing his costs of manufacture, our friend will gradually be forced out of business unless he, too, pays attention to the costs of manufacture. If he is unable to improve his methods, we shall witness the passing of an employer whose policy prevents an increase in the standard of living of everyone he employs to the ultimate benefit of the competitor who, by his initiative, is raising the standard of life of his employees.

The public generally will benefit by a reduction in the price of any commodity. As the time must come when some competitor will adopt the policy of reducing prices, the stand-still employer must sooner or later look to his laurels. It will be recalled that many motor-car manufacturing firms, well known a few years before the war, have gone out of business chiefly on account of their lack of initiative in reducing prices by lowering production costs.

Under free and wholesome competition a manufacturing business—and most other businesses—cannot stand still. It must either go forward or fall behind in the race. To go forward it must continually improve its services to the consumers either by reducing the price or improving the quality of its products. To enable the firm to improve its services continually it must adopt the policy of raising its workers to a better standard of living.

Our aim should be to raise wages. This cannot be accomplished unless means are provided for increasing the workers' productivity.

In Great Britain to-day inefficiency has become almost a vested interest. Speeches are made to the public and shareholders of public companies, to explain why increased uneconomic expenditure has become necessary or that losses are being incurred by a company on account of some outside forces over which it has no control.

Not long ago the chairman of a British engineering company, after reviewing the unsatisfactory trading of the past year and mentioning the fact that Germany had secured orders which in ordinary circumstances would have been executed in this country, said to the shareholders :

> "There are two outstanding causes for the condition in which we find ourselves : high costs of manufacture and the unsuitability in many ways of our fiscal and financial systems for meeting modern large-scale competition. I have already alluded to the increase in cost inevitable when works are only partially employed ; when the manufacturer's costs are high he cannot quote low prices ; when he cannot quote low prices he cannot fill his works ; when he cannot fill his works his costs are higher ; and so it goes on from bad to worse."

The shareholders were therefore being told, apart from any other causes of failure to secure orders, that, in other words, a policy of raising prices to consumers is suicidal. As the remedy is obvious no comment is necessary.

When employers keep certain information from their workers there are always some among the latter who suspect that something is being kept back to their disadvantage. Employers in Great Britain are peculiarly reticent about the details of the costs which go to make

up the selling price of their products. Whatever harm there may be in letting the men know the percentage of profit made, considerably more harm is done by not telling them. If employers persistently refuse to take the workers into their confidence they must expect a growing suspicion that there are some facts which cannot bear the light of day.

Employers must give up the theory that the only proper rate of wages that the men can claim is one which borders on a subsistence level or fodder basis, or that a "reasonable" wage is the equivalent of the *real* wages obtaining before the war.

For the progressive advancement of a business, employers must obtain the full support and confidence of their workers. Mutual suspicion detracts greatly from the value of any co-operation. Employers could avoid any suspicion arising out of the conditions indicated above by the simple expedient of allowing representatives of the workers to see any particulars they desire of the charges which affect the ultimate cost of the goods the workers produce. Furthermore, the representatives of the men should be convinced that every charge which is added to the cost of manufacture is justifiable and in the firm's interest as a whole. The new spirit in industry must be shown by the masters as well as the men and, to make it as true as we should all desire it to be, it is surely essential, as a first step, for the masters to take the men into their confidence.

When it becomes necessary for a firm to make economy cuts, a magnificent example would be shown to all engaged in the firm's employ if the directors firstly stopped their own fees. This procedure is actually practised in some quarters in the United States. Here again the initiative must be taken by the employer. In the matter of the relations between employers and workers America is undoubtedly many years ahead of us.

We in England are being accused, not without reason, of the worship of equipment. Equipment should be considered purely and simply as a means to an end—the end being profit. We have been so slow to depreciate our plant that, in many cases, workers, foremen and managers have come to have a sneaking regard for the machinery, with its polished brass fittings and the familiar drone of its inefficient working. In consequence when the time arrives for a new machine to be purchased, unnecessary embellishments and finish are too often required of the maker.

Owing to the devastation of the war, Great Britain is short of about 40,000 men who would, by now, hold senior positions in businesses and whose age, on the average, would only be thirty-five years. By this amount we lack initiative, energy and enterprise. This shortage is undoubtedly an important contributory factor to our trade depression since duties which would be discharged by the men of an average age of thirty-five years are now in the hands of older men. The balance

of experience and enterprise could, however, be re-adjusted if the older members of a firm extended a greater measure of responsibility to the younger.

Compared with pre-war times, Great Britain is at the present moment short of men between the ages of thirty and forty. As men grow older they rely more and more upon experience and less upon enterprise in their endeavours to progress. Enterprise and initiative are more important elements to progress than is experience and it is the diminution of the former qualities from which we are suffering.

The state of our trade has been responsible for a curious change in recent years in the effective use of the available ability in this country. Since the tendency of the prices of our products has been on the high side, firms have endeavoured to secure orders by devoting the major portion of their attention to effective salesmanship. The natural result has been the attraction of too great a proportion of ability from the production side to the selling side of manufacturing concerns. Our trade figures have shown the results of this policy to be unsatisfactory. Forcing sales at high prices, whatever the ability employed, is a far more difficult way of securing orders than reducing prices for effecting the same object. This misdirection of ability has been responsible for depriving the production side of manufacture of some proportion of the driving force for increasing efficiency.

It is impossible to attain a high state of efficiency in any manufacturing business without, at the same time, granting a reward commensurate with success to all employed. The only way to secure the maximum concentration of effort from a man is to pay him well, and this applies equally from the highest to the lowest engaged in industry. No business, on the other hand, can be in an economically sound position to pay high wages or salaries unless its efficiency is high. *High wages are therefore an index of efficiency.* Examples of enterprises are available in some of which wages are low and in others wages are high. A careful examination into their conditions cannot but reveal the truth that low wages are accompanied by low efficiency and high wages with good efficiency. In Great Britain we find low wages in many coal-mines and high wages in Coventry. To ask workers to accept less wages is merely equivalent to an attempt to reduce the firm's efficiency.

For Great Britain to be prosperous all workers with both brain and hand must give of their best and, so long as we do not go forward with the times and employ machinery for increasing the workmen's productivity, then so long shall we remain with a state of bad trade. Bad trade only means, in effect, that other peoples do not require our services, and the only reason why they do not require our services is because they are too expensive. Our services are expensive because we do not get the utmost results from our activities.

The authors have endeavoured to explain to industrialists and workers alike the reasons for the American economic wonder and have also attempted to show that, although the conditions may be somewhat different, no insurmountable obstacle presents itself to the attainment of a 'British economic wonder.'

It only remains for us to wake up to the realities of present-day conditions and put our own house on an economic footing. The future of Great Britain will not then be so black as some of our pessimists seem to have painted it, but "unprecedented prosperity" is assured to the Old Country.

The Secret of High Wages lies in the adherence to the principles which have been discussed in this book and which aim at simplicity in all things. There is a French saying, "*Pourquoi compliquer la vie.*"

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